

ORDINANCE NO. 2363

AN ORDINANCE OF THE CITY OF FREMONT ADDING CHAPTER 10 (EARTHQUAKE HAZARD REDUCTION REQUIREMENTS IN EXISTING WOOD FRAME RESIDENTIAL BUILDINGS WITH SOFT, WEAK OR OPEN-FRONT WALLS) TO TITLE VII (BUILDING REGULATIONS) OF THE FREMONT MUNICIPAL CODE WITH RESPECT TO VOLUNTARY EARTHQUAKE HAZARD REDUCTION STANDARDS FOR EXISTING WOOD FRAME RESIDENTIAL BUILDINGS WITH SOFT, WEAK OR OPEN-FRONT WALLS

The City Council of the City of Fremont does ordain as follows:

Section 1:

Title VII (Building Regulations) of the Fremont Municipal Code is hereby amended by the addition of a new Chapter 10 (Earthquake Hazard Reduction Requirements in Existing Wood Frame Residential Buildings with Soft, Weak or Open-Front Walls) to read as follows:

Sec. 7-10100. Title.

This Chapter shall be known as the "Soft-Story Residential Buildings Retrofit Ordinance."

Sec. 7-10105. Purpose.

The purpose of this Chapter is to promote the public welfare and safety by reducing the risk of death or injury that may result from the effects of earthquakes on existing wood-frame multi-unit buildings as identified in Section 7-10115. This Chapter creates minimum standards to strengthen the more vulnerable portions of these structures. When fully followed, these minimum standards will considerably improve the performance of these buildings but will not necessarily prevent loss of life or injury or prevent earthquake damage to retrofitted buildings.

Sec. 7-10110. Finding and Determination.

The City of Fremont is located within Seismic Zone 4.

The City Council desires to lessen the risks to life and property of the residents of the City of Fremont posed by a major earthquake along the Hayward Fault.

Neither the Uniform Building Code nor the California Building Standards contain provisions governing the earthquake retrofit of soft-story residential buildings.

The City Council, therefore, has determined to implement a seismic hazard identification

and mitigation program that notifies owners of the potential earthquake hazard of soft-story residential buildings, provides standards for retrofit and establishes a 12-month period for the voluntary retrofit of soft-story buildings.

Sec. 7-10115. Scope.

The provisions of this Chapter shall apply to all existing wood frame buildings, or portions thereof, designed using the Building Code in effect before December 28, 1995, which are used as hotels, lodging houses, congregate residences or apartment houses where the ground floor portion of the wood frame structure contains parking or other similar open floor space that causes soft, weak, or open wall lines as defined in this section, and having one or more levels above the ground floor and hereinafter referred to as “soft-story” construction.

The criteria for these provisions is based on obtaining a life safety performance level for the building. Higher performance levels, in which damage to the building would be further reduced, may be obtained through more detailed evaluation and design.

Sec. 7-10120. Definitions.

Notwithstanding the applicable definitions, symbols and notations in the Building Code, the following definitions shall apply for the purposes of this Chapter:

Aspect ratio is the ratio of the height of a wall section to its width. Wall height is measured from sill plate to top of double top plate.

Building Code is the Uniform Building Code (UBC) as published by the International Conference of Building Officials, 1997 edition, as adopted by the State of California, or the corresponding sections in the latest edition.

Building Official is the officer or other designated authority charged with the administration and enforcement of this code, or the building official’s duly authorized representative.

Cripple Wall is a wood-framed stud wall extending from the top of the foundation wall to the underside of the lowest floor framing, and not enclosing a parking or otherwise habitable area.

Concrete Anchors:

Expansion Anchor is an approved mechanical fastener placed in hardened concrete, designed to expand in a self-drilled or pre-drilled hole of a specified size and engage the sides of the hole in one or more locations to develop shear and/or tension resistance to applied loads without grout, adhesive or drypack.

Chemical Anchor is an approved metal fastener and structural epoxy anchoring device in hardened concrete or solid masonry. It is designed to adhere to the sides of a pre-drilled hole of specified size to develop shear and/or tension resistance to applied loads.

Undercut Anchor is an approved mechanical fastener placed in hardened concrete, designed to expand into an undercut specially pre-drilled hole of specified size. The anchor engages the sides and undercut surfaces of the hole in one or more locations to develop high shear and/or tension resistance to applied loads without grout, adhesive or drypack.

Floor Diaphragm Aspect Ratio is the ratio of the diaphragm depth to its width (diaphragm depth measured perpendicular to the open front).

Ground Floor is any floor within the wood frame portion of a building whose elevation is immediately accessible from an adjacent grade by vehicles or pedestrians. The ground floor portion of the structure does not include any level that is completely below adjacent grades.

Level is a story, basement, or underfloor space of a building with cripple walls exceeding four feet in height.

Multi-Unit Residential Buildings are hotels, lodging houses, congregate residences and apartment houses.

Nonconforming Structural Materials are wall bracing materials which are no longer permitted in this Code. These methods or materials include, but are not limited to, cement or gypsum plaster, gypsum wallboard, diagonal or let-in bracing, straight or diagonal wood sheathing, particle board and structural wood panels.

Open Front Wall Line is an exterior wall line without vertical elements of the lateral force resisting system which requires tributary seismic forces to be resisted by diaphragm rotation or excessive cantilever beyond parallel lines of shear walls. Diaphragms that cantilever more than twenty-five percent of the distance between adjacent lines of lateral force resisting elements shall be considered excessive. Exterior exit balconies shall not be considered as excessive cantilevers.

Retrofit is an improvement of the lateral force resisting system by alteration of existing structural elements or addition of new structural elements.

Second Floor is the first elevated floor level.

Soft Wall Line is a wall line whose lateral stiffness is less than required by the story drift limitations or deformation compatibility requirements of this Chapter. In lieu of analysis, this may be defined as a wall line in a story where the story stiffness is less than 70

percent of the story above for the direction under consideration.

Story Strength is the total strength of all compatible seismic resisting elements sharing the story shear in the direction under consideration.

Wall Diaphragm Aspect Ratio is the ratio of the height of a wall section to its width.

Wall Line is any length of a wall along a principal axis of the building used to provide resistance to lateral loads. Parallel wall lines separated by less than four feet shall be considered one wall line for the distribution of loads.

Weak Wall Line is a wall line laterally braced with nonconforming structural materials or a wall line in a story where the story strength is less than 80 percent of the story above in the direction under consideration.

Sec. 7-10125. Notice of Determination.

Whenever the Building Official determines that any multi-unit residential building is of soft-story construction, the Building Official shall initiate proceedings to notify the owner(s) of the building of the standards of this Chapter.

The Building Official shall issue a notice to the owner(s) of record of the building containing the following information:

- (a) The street address and Assessor's Parcel Number of the subject building.
- (b) The potential for seismic hazard due to the soft-story construction of the building.
- (c) The standards of this Chapter, the voluntary nature of the standards, the possibility of a mandatory ordinance and the applicable time frames.
- (d) Notification of recordation of a Notice of Potentially Hazardous Structure.
- (e) The name and telephone number of a City employee who will be able to answer questions concerning the ordinance and notice.
- (f) Applicable appeal procedures pursuant to Section 7-10140.

Sec. 7-10130. Service of Notice.

The notice shall be served upon the owner(s) of record either personally or by depositing a copy of the notice in the U.S. Mail, postage prepaid, return receipt requested, addressed to the owner(s) at the last address listed on the last equalized assessment roll of the county. If no address appears on the last equalized assessment roll of the county or is known to the Building Official, a copy of the notice shall be mailed, by first class mail,

addressed to the owner(s) of record, to the address of the subject building. The failure of any owner or other person to receive such notice shall not affect the validity of the proceedings under this Chapter.

Upon service of the notice, the Building Official shall complete a declaration certifying to the date and manner in which the notice was served. Any returned receipt card acknowledging service of the notice shall be attached to the declaration.

Sec. 7-10135. Recordation of Notice.

At the time the notice is served on the owner(s) of record, the Building Official shall cause to be filed with the Office of the County Recorder a "Notice of Potentially Hazardous Structure," setting forth the determination of the Building Official and the standards of this Chapter.

Sec. 7-10140. Appeal of Determination.

The notice of determination may be appealed to the Building Official within thirty (30) days of service of the Notice of Determination.

Sec. 7-10145. Recordation of Rescission.

If, after issuance of the notice, a building is determined by the Building Official not to be subject to the standards of this Chapter, the Building Official shall file in the Office of the County Recorder a certificate rescinding the Notice of Potentially Hazardous Structure and finding the building not to be subject to the standards of this Chapter.

Sec. 7-10150. Recordation of Compliance.

After completion of retrofitting pursuant to the standards of this Chapter, the Building Official shall file in the Office of the County Recorder a finding that the building is in compliance with the standards of this Chapter.

Sec. 7-10155. Analysis and Design.

- (a) *General:* Buildings regulated by this Chapter, as defined in Section 7-10115, Scope, shall be analyzed, designed and constructed in conformance with the 1997 Uniform Building Code except as modified in this Chapter. Prior to any analysis, an initial screening review of the buildings shall be performed as noted in Section 7-10160(a). All items found noncompliant shall be addressed in this analysis.

No alteration of the existing force-resisting or vertical load-carrying system shall reduce the strength or stiffness of the existing structure. When any portion of a building within the scope of this Chapter is constructed on or into a slope steeper than 1 unit vertical in 3 units horizontal, the lateral-force-resisting system at and below the base level diaphragm shall be analyzed for the effects of concentrated lateral forces at the base due to this hillside condition.

Exception:

- (1) Buildings in which all items on the applicable checklists Table 1 through Table 4 are marked compliant.
 - (2) Two-story buildings of no geometrical irregularity, when the roof covering of the structure is of material weighing 5 psf or less; the aspect ratio of the floor diaphragm meets the current code requirements and only when deemed appropriate by the Building Official, prescriptive measures provided in Section 7-10165 may be used.
- (b) *Initial Screening:* Prior to any analysis, an initial screening review of the buildings shall be performed. Each of the evaluation statements on the checklist tables 1 to 4 of Section 7-10175 shall be marked compliant (C), noncompliant (NC), or not applicable (N/A). Compliant statements identify issues that are acceptable according to the criteria of this Chapter, while noncompliant statements identify issues that require further investigation. Certain statements may not apply to the buildings being evaluated. For noncompliant evaluation statements, the design professional may choose to conduct further investigation.

Sec. 7-10160. Analysis, Evaluation and Retrofit.

- (a) *Scope of Analysis:* This Chapter requires the alteration, repair replacement or addition of structural elements and their connections to meet the strength and stiffness requirements herein. The lateral load path analysis shall include the resisting elements and connections from the wood diaphragm above any soft, weak or open front wall lines to the foundation soil interface or the upper level of a Type I structure below. The top story of any building need not be analyzed. The lateral load path analysis for added structural elements shall also include evaluation of the allowable soil bearing and lateral pressures in accordance with

UBC Section 1805.

Exception: When an open front, weak or soft wall line exists due to parking at the ground level of a two-level building and the parking area is less than 20 percent of the ground floor level, then only the wall lines in the open, weak or soft directions of the enclosed parking area need comply with the provisions of this Chapter.

- (b) *Design Base Shear:* The design base shear in a given direction shall be 75% of the value determined by Formula (30A-4) through Formula (30A-7) in UBC Section 1630.2.1.
- (c) *Vertical Distribution of Forces:* The total seismic force shall be distributed over the height of the structure based on Formula (30A-15) in UBC Section 1630.5. Distribution of force by story weight shall be permitted for two story buildings. The value of R , used in the design of any story shall be less than or equal to the value of R used in the given direction for the story above.
- (d) *Weak Story Limitation:* The structure shall not exceed 30 feet in height or two levels if the lower level strength is less than 65 percent of the story above. Existing walls shall be strengthened as required to comply with this provision unless the weak level can resist a total lateral seismic force of Ω_0 times the design force prescribed in Section 7-10160(b).

The story strength for each level of all other structures shall be a minimum of 80 percent of the story above.

- (e) *Story Drift Limitation:* The calculated story drift for each retrofitted level shall not exceed the allowable deformation compatible with all vertical load resisting elements 0.025 times the story height. The calculated story drift shall not be reduced by the effects of horizontal diaphragm stiffness but shall be increased when these effects produce rotation.

The effects of rotation and soil stiffness shall be included in the calculated story drift when lateral loads are resisted by vertical elements whose required depth of embedment is determined by pole formulas such as Formula (6A-1) and (6A-2) in UBC Section 1806.8.2. The coefficient of variation of subgrade reaction used in the deflection calculations shall be provided from an approved geotechnical engineering report or other approved methods.

- (f) *$P \Delta$ Effects:* The requirements of UBC Sections 1630.13 and 1633.2.4 shall apply except as modified herein. All structural framing elements and their connections, not required by design to be part of the lateral-force resisting system, shall be designed and /or detailed to be adequate to maintain support of design dead plus live loads when subjected to the expected deformations caused by seismic forces.

The stress analysis of cantilever columns shall use a buckling factor of 2.1 for the direction normal to the axis of the beam.

- (g) *Ties and Continuity:* All parts of the structure included in the scope of Section 7-10160 shall be interconnected and the connection shall be capable of resisting the seismic force created by the parts being connected. Any smaller portion of a building shall be tied to the remainder of the building with elements having a strength to resist $.5C_dI$ times the weight of the smaller portion. A positive connection for resisting a horizontal force acting parallel to the member shall be provided for each beam, girder or truss included in the lateral load path. This force shall not be less than $.5C_dI$ times the dead plus live load.
- (h) *Cripple Walls:* Unbraced cripple walls as found noncompliant in Table 2 shall be analyzed and designed per Appendix Chapter 6 of the UCBC 1997, "Prescriptive Provisions for Seismic Strengthening of Cripple Walls and Sill Plate Anchorage of Light, Wood-framed, Residential Buildings." When a single top plate exists in the cripple wall, all end joints in the top plate shall be tied. Ties shall be connected to each end of the discontinuous top plate and shall be equal to one of the following:
 - (1) 3-inch by 6-inch, 18 gauge galvanized steel and nailed with six 8d common nails at each end.
 - (2) 1¼-inch by 12-inch, 18 gauge galvanized steel and nailed with six 16d common nails at each end.
 - (3) 2-inch by 4-inch by 12-inch wood blocking and nailed with six 16d common nails at each end.
- (i) *Collector Elements:* Collector elements shall be provided which can transfer the seismic forces originating in other portions of the building to the elements within the scope of Sections 7-10155 and 7-10160 that provide resistance to those forces.
- (j) *Horizontal Diaphragms* The analysis of shear demand or capacity of an existing plywood or diagonally sheathed horizontal diaphragm need not be investigated unless the diaphragm is required to transfer lateral forces from the lateral resisting elements above the diaphragm to other lateral resisting elements below the diaphragm due to offset in placement of the elements.

Diaphragm rotation effects shall be considered in the analysis when unsymmetrical wall stiffness increases seismic forces to vertical elements.
- (k) *Shear Walls:* Shear walls shall have sufficient strength and stiffness to resist the tributary seismic loads and shall conform to the special requirements of this section.

- (1) *Gypsum or Plaster Products:* Gypsum or plaster products shall not be used to provide lateral resistance.
- (2) *Wood Structural Panels.*
 - (A) *Drift Limit:* Wood structural panel shear walls shall meet the story drift limitation of Section 7-10160(e). Conformance to the story drift limitation shall be determined by approved testing or calculation or analogies drawn therefrom and not by the use of an aspect ratio. Calculated deflection shall be determined according to UBC Standard 23-2, Section 23.223, "Calculation of Shear Wall Deflection," and 25 percent shall be added to account for inelastic action and repetitive loading. Contribution to the deflection from the anchor or tie down slippage shall also be included. The slippage contribution shall include the vertical elongation of the metal, the vertical slippage of the connectors and compression or shrinkage of the wood elements. The vertical slippage shall be multiplied by the aspect ratio and added to the total horizontal deflection. Individual shear panels shall be permitted to exceed the maximum aspect ratio provided the story drift and allowable shear capacities are not exceeded.
 - (B) *Openings* Openings are permitted in shear walls if they do not exceed 50 percent of the height or width of the shear wall. The remaining portion of the shear wall shall be strengthened for the transfer and increase of all shearing forces caused by the opening. The resulting shear wall shall be analyzed as a mosaic of shear resisting elements. Blocking and steel strapping shall be employed at the corners of the opening to transfer forces from discontinuous boundary elements into adjoining panel elements.

The effect of openings on the stiffness of the shear wall shall be demonstrated to comply with the requirements of Section 7-10165(c). The stiffness shall be calculated using the properties of the different shear elements making up the shear wall or it shall be demonstrated by approved testing. When shear walls cannot be made to conform to the requirements of this section because of existing openings, either 1) the openings shall be relocated or reduced in width to meet the strength and stiffness requirements of the lateral loads or 2) the walls shall not be considered as part of the lateral resisting system.

Relocated and altered openings shall comply with the emergency escape requirements in Chapter 3 of the UBC. Relocated and

altered openings shall comply with the light and ventilation requirements in Chapter 12 of the UBC unless otherwise approved by the Building Official.

- (C) *Wood Species of Framing Members:* Allowable shear values for wood structural panels shall consider the species of the framing members. When the allowable shear values are based on Douglas fir-larch framing members and framing members are constructed of other species of lumber, the allowable shear values shall be multiplied by the following factors: 0.82 for species with specific gravities greater than or equal to 0.42 but less than 0.49, and 0.65 for species with specific gravities less than 0.42. Redwood shall use a factor of 0.65 and hem fir shall use a factor of 0.82 unless otherwise approved.
- (3) *Substitution for 3-inch Nominal Width Framing Members:* Two 2- inch nominal width framing members shall be permitted in lieu of any required 3-inch nominal width framing member when the existing and new framing member are of equal dimensions, are connected as required to transfer the in-plane shear between them and the sheathing fasteners are equally divided between them.
- (4) *Holdown Connectors:*
 - (A) *Expansion Anchors in Tension:* Expansion anchors that provide tension strength by friction resistance shall not be used to connect holdown devices to existing concrete or masonry elements. Expansion anchors that provide tension strength by bearing (commonly referred to as "undercut" anchors) shall be permitted.
 - (B) *Required Depth of Embedment:* The required depth of embedment or edge distance for the anchor used in the holdown connector shall be provided in the concrete or masonry below any plain concrete slab unless satisfactory evidence is submitted to the Building Official that shows that the concrete slab and footings are of monolithic construction.
 - (C) *Required Preload of Bolted Holdown Connectors:* Bolted holdown connectors shall be preloaded to reduce slippage of the connector. Preloading shall consist of tightening the nut on the tension anchor after the placement but before the tightening of the shear bolts in the panel flange member. The tension anchor shall be tightened until the shear bolts are in firm contact with the edge of the hole nearest the direction of the tension anchor. Holdown connectors with self-jigging bolt standoffs shall be installed in a manner to permit preloading.

(5) *Materials Of Construction:*

- (A) *New Materials:* All materials approved by the UBC, including their appropriate allowable stresses and minimum aspect ratios, shall be permitted to meet the requirements of this Chapter.
- (B) *Allowable Foundation and Lateral Pressures:* Allowable foundation and lateral pressures shall be permitted to use the values from UBC Table 18-I-A. The coefficient of variation of subgrade reaction shall be established by an approved geotechnical engineering report or other approved methods when used in the deflection calculations of embedded vertical elements as required in Section 7-10160(c).
- (C) *Existing Materials:* All existing materials shall be in sound condition and constructed in conformance to the UBC before they can be used to resist the lateral loads prescribed in this Chapter. The verification of existing material conditions and their conformance to these requirements shall be made by physical observation reports, material testing or record drawings as determined by the structural designer and approved by the Building Official.
 - 1) *Horizontal Wood Diaphragms* Existing horizontal wood diaphragms that require analysis under Section 7-10160(j) shall be permitted to use Table A-1-D of the 1997 Uniform Code of Building Conservation for their allowable values.
 - 2) *Wood Structural Panel Shear Walls:*
 - a) *Allowable Nail Slip Values:* When the required drift calculations of Section 7-10160(2)(A) rely on the lower slip values for common nails or surfaced dry lumber, their use in construction shall be verified by exposure. The use of box nails and unseasoned lumber may be assumed without exposure. The verification of surfaced dry lumber shall be by identification conforming to UBC Section 2340.1.
 - b) *Plywood Panel Construction:* When verification of the existing plywood materials is by use of record drawings alone, the panel construction for plywood shall be assumed to be of three plies. The plywood

modules "G" shall be assumed equal to 50,000 psi.

- c) *Framing Members of Other Species:* When verification of the existing wood material is by use of record drawings, the allowable shear capacity for wood structural panels shall be multiplied by the reduction factor of 0.82 for buildings built on or after 1960. Buildings built before this period shall use the reduction factor 0.65. When verification of the existing wood material is by identification in conformance to UBC Section 2340.1.2, the allowable shear capacity shall be determined in accordance with Section 7-10160(2)(c).
- 1) *Lumber:* When the existing dimensioned lumber is not identified in conformance to UBC Section 2340.1.2, the following allowable stresses shall be permitted for the structural elements specified below.
- | | |
|--------------------|-------------------------------|
| Posts and Beams | Douglas Fir-larch No. 1 Grade |
| Joists and Rafters | Douglas Fir-larch No. 2 Grade |
| Studs, Blocking | Hem Fir Stud Grade |
- (2) *Structural Steel:* All existing structural steel shall be permitted to use the allowable stresses for Grade A36. Existing pipe or tube columns shall be assumed to be of minimum wall thickness unless verified by testing or exposure.
- (3) *Strength of Concrete:* All existing concrete footings shall be permitted to use the allowable stresses for plain concrete with a compressive strength of 2,000 psi. The strength of existing concrete with a record compressive strength greater than 2,000 psi shall be verified by testing, record drawings or City records.
- (4) *Existing Sill Plate Anchorage:* Existing cast-in-place anchor bolts shall be permitted to use the allowable service loads for bolts with proper embedment when used for shear resistance to lateral loads.

Sec. 7-10165. Prescriptive Measures for Weak Story.

- (a) *Scope:* The proposed prescriptive measures provided here are to reduce the earthquake vulnerability of the structure and reduce the possibility of collapse or partial collapse of the building in the event of a moderate to major earthquake.
- (b) *Performance:* The improved earthquake performance of the structure due to the proposed prescriptive measures varies and is greatly controlled by all of the following: proximity to the fault line, soil type, weight of roof and floor above, quality of existing walls, posts and columns and their connections to the floor diaphragm, and the quality of construction provided in order to comply with the prescriptive measures. The implementation of the proposed measures is not intended to improve the earthquake performance of the building above the first story.
- (c) *Limitation:* The proposed prescriptive measures rely on rotation of the second floor diaphragm to distribute the load between the side and rear wall enclosing the parking area. Owner shall provide access to ensure that the floor diaphragm is of plywood or comparable material. In the absence of such a verification, a new plywood diaphragm must be applied of minimum thickness of $\frac{3}{4}$ inches and with 10d penny common nails at 6 inches on center.
- (d) *Additional conditions:* In order to qualify for prescriptive measures, the following additional conditions must be satisfied:
 - (1) Diaphragm aspect ratio = $\frac{2}{3}$ or less
 - (2) Minimum length of side shear walls = 20 feet with less than 10% openings.
 - (3) Minimum length of rear shear walls = $\frac{3}{4}$ of rear wall length
- (e) *Minimum Required Retrofit:*
 - (1) *Anchor bolt spacing:* The anchor bolt spacing size and spacing shall be a minimum of $\frac{1}{2}$ inch diameter at 32 inches on center. When existing bolts are inadequate, new steel plates bolted to the side of the foundation and nailed to sill may be used, such as an approved connector.
 - (2) *Connection to floor above:* The connection to the floor above shall be made with 18 gauge galvanized steel angle clips $4\frac{1}{2}$ inches long with 12-8d nails at 16 inches on center at second floor blocking or rim joist to top plates of the shear walls or by equivalent shear transfer methods.
- (f) *Shear Wall Sheathing:* The shear wall sheathing shall be a minimum of $\frac{15}{32}$ inch 5 ply structural 1 with 10d nails at 4 inches on center at edges and 12 inches

on center at field; blocked all edges with 3 x 4 or larger. Where existing sill plates are less than 3x thick, place flat 2x on top of sill between studs with flat 18 gauge galvanized steel clips 4 ½ inches long with 12-8d nails or 3/8 inch diameter lags through blocking for shear transfer to sill plate. Stagger nailing from wall sheathing between existing sill and new blocking. Anchor new blocking to foundation as specified above.

- (g) *Shear Wall Holdowns:* The minimum shear wall connector holdown shall be an approved connector with a minimum 5/8 inch diameter threaded rod anchor with 5 inch embedment in concrete at ends of shear walls (2 anchors at intersecting corners) with a minimum design load of 4,000 pounds. Tie rod systems shall not be less than 5/8 inch diameter unless using high-strength cable. Threaded rod or high-strength cable elongation shall not exceed 5/8 inch using design forces.

Sec. 7-10170. Required Information on Plans.

- (a) *General:* The plans shall show all necessary dimensions and materials for plan review and construction and shall accurately reflect the results of the engineering investigation and design. Details, specific to the actual condition found, shall be shown on the drawings to assure installation of all elements required for construction of the necessary complete load path.
- (b) *Existing Construction:* The plans shall show the existing diaphragm and shear wall sheathing and framing materials, fastener type and spacing, diaphragm and shear wall connections, continuity ties, and collector elements. The plans shall also show the portion of the existing materials that needs verification during construction.

(c) *New Construction:*

- (1) *Foundation Plan Elements:* The foundation plan shall include the size, type, location and spacing of all anchor bolts with the required depth of embedment, edge and end distance; the location and size of all columns for braced or moment frames; referenced details for the connection of braced or moment frames to their footing and referenced sections for any grade beams and footings.
- (2) *Framing Plan Elements:* The framing plan shall include the width, location and material of shear walls; the width, location and material of frames; references on details for the column to beam connectors, beam to wall connections, and shear transfers at floor and roof diaphragms; and the required nailing and length for wall top plate splices.
- (3) *Shear Wall Schedule, Notes and Details:* Shear walls shall have a referenced schedule on the plans that includes the correct shear wall capacity in pounds per foot; the required fastener type, length, gauge and head size; and a complete specification for the sheathing material and its thickness. The schedule shall also show the required location of 3 inch nominal or two 2 inch nominal edge members; the spacing of shear transfer elements such as framing anchors or added sill plate nails; the required hold-down with its bolt, screw or nail sizes; and the dimensions, lumber grade and species of the attached framing member.

Notes shall show required edge distance for fasteners on structural wood panels and framing members; required flush nailing at the plywood surface; limits of mechanical penetrations; and the sill plate material assumed in the design. The limits of mechanical penetrations shall also be detailed showing the maximum notching and drilled hole sizes.

- (4) *General Notes:* General notes shall show the requirements for material testing, special inspection, structural observation and the proper installation of newly added materials.
- (5) *Engineer's or Architect's Statement:* The responsible engineer or architect shall provide the following statements on the approved plans:

"I am responsible for designing this building's seismic strengthening in compliance with the minimum regulations of Appendix 7 of the Uniform Building Code of Conservation," and when applicable, "The registered deputy inspector, required as a condition of the use of structural design stresses requiring continuous inspection, will be responsible to me."

Sec. 7-10175. Basic Structural Checklist.

Table 1 - Building System

C	NC	N/A	LOAD PATH: The structure shall contain one complete load path for seismic force effects from any horizontal direction that serves to transfer the inertial forces from the mass to the foundation.
C	NC	N/A	WEAK STORY: The strength of the lateral-force system in any story shall not be less than 80% of the strength in an adjacent story above or below.
C	NC	N/A	SOFT STORY: The stiffness of the lateral-force resisting system in any story shall not be less than 70% of the stiffness in an adjacent story above or below or less than 80% of the average stiffness of the three stories above or below.
C	NC	N/A	VERTICAL DISCONTINUITIES: All vertical elements in the lateral-force resisting systems shall be continuous to the foundation.
C	NC	N/A	DETERIORATION OF WOOD: There shall be no signs of decay, shrinkage, splitting, fire damage, or sagging in any of the wood members and none of the metal accessories shall be deteriorated, broken, or loose.
C	NC	N/A	WALL ANCHORAGE: Exterior concrete or masonry walls shall be anchored for out-of-plane forces at each diaphragm level with steel anchors or straps that are developed into the diaphragm. Straps shall be minimum 7 gauge.

Table 2 -Lateral Force Resisting System

C	NC	N/A	REDUNDANCY: The number of lines of shear walls in each principal direction shall be greater than or equal to 2.
C	NC	N/A	SHEAR STRESS CHECK: The shear stress in the shear walls, shall be less than the following values: 5 Ply Structural panel sheathing: 400 plf 3 Ply Struc. Panel & Diagonal sheathing: 200 plf Straight sheathing: 80 plf
C	NC	N/A	STUCCO (EXTERIOR PLASTER) SHEAR WALLS: Multistory buildings shall not rely on exterior stucco walls as the primary lateral force-resisting systems.
C	NC	N/A	GYPSUM WALLBOARD OR PLASTER SHEAR WALLS: Interior plaster or gypsum wallboard shall not be used as shear walls on buildings over one story in height.
C	NC	N/A	NARROW WOOD SHEAR WALLS: Narrow wood shear walls with an aspect ratio greater than 2 to 1 for Life Safety shall not be used to resist lateral forces developed in the building.
C	NC	N/A	WALLS CONNECTED THROUGH FLOORS: Shear walls shall have interconnection between stories to transfer overturning and shear forces through the floor.
C	NC	N/A	HILLSIDE SITE: For a sloping site greater than 1 vertical to 3 horizontal and with greater than one-half story above the base, the base shear in the downhill direction, including forces from the base level diaphragm, shall be resisted through primary anchors from diaphragm struts or collectors provided in the base level framing to the foundation.
C	NC	N/A	CRIPPLE WALLS: All cripple walls below first floor level shear walls shall be

			braced to the foundation with shear elements.
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Table 3 - Connections

C	NC	N/A	WOOD POSTS: There shall be a positive connection of wood posts to the foundation.
C	NC	N/A	WOOD SILLS: All wood sills shall be bolted to the foundation.
C	NC	N/A	GIRDER/COLUMN CONNECTION: There shall be a positive connection between the girder and the column support.
C	NC	N/A	WOOD SILL BOLTS: Sill bolts shall be spaced at 6 ft. or less, with proper edge distance provided for wood and concrete.

Table 4 - Lateral Force Resisting System¹

C	NC	N/A	OPENINGS: Walls with garage doors or other large openings shall be braced with plywood shear walls or shall be supported by adjacent construction through substantial positive ties.
C	NC	N/A	HOLDOWN ANCHORS: All walls shall have properly constructed holdown anchors.
C	NC	N/A	DIAPHRAGM CONTINUITY: The diaphragms shall not be composed of split level floors. In wood buildings, the diagrams shall not have expansion joints.
C	NC	N/A	STRAIGHT SHEATHING: All straight sheathed diaphragms shall have aspect ratios less than 2 to 1.
C	NC	N/A	SPANS: All wood diaphragms with spans greater than 24 feet shall consist of wood structural panels or diagonal sheathing. Wood commercial and industrial buildings may have rod-braced systems.
C	NC	N/A	UNBLOCKED DIAPHRAGMS: All unblocked wood structural panel diaphragms shall have horizontal spans less than 40 feet and shall have aspect ratios less than or equal to 4 to 1.

¹The Basic Structural Checklist shall be completed prior to completing this Supplemental Structural checklist

Sec. 7-10180. Waiver of certain plan check and building permit fees.

Plan check and building permit fees for soft-story projects which are submitted after the effective date of this ordinance shall be waived subject to the following limitations:

- (a) All required retrofit construction work is completed according to the timetables specified in this Chapter.
- (b) The scope of work for which the above fees are refundable is limited to the seismic retrofit of a soft-story building and provision of disabled access compliances triggered by any seismic retrofit.
- (c) Any additional work done in conjunction with seismic retrofit will be assessed and fees will be charged based upon the valuation of the work.

- (d) Plan check fees beyond the third cycle of review, plan check fees for revisions to approved plans, and re-inspection fees shall not be waived and shall be assessed on a per-hour basis.

Section 2:

This ordinance shall be published once in The Argus, a newspaper of general circulation, printed and published in Alameda County and circulated in the City of: Fremont, within fifteen (15) days from and after its adoption and shall take effect and be enforced thirty (30) days after its adoption.

The foregoing ordinance was duly introduced before the city council of the City of Fremont, County of Alameda, at the regular meeting of the City Council of such City, held on the 2nd day of November, 1999 and finally adopted at a regular meeting of said Council held on the 9th day of November, 1999, by the following vote, to wit:

AYES: Vice Mayor Pease, Councilmembers Wasserman, Zlatnik, and Zager

NOES: None

ABSENT: Mayor Morrison and Councilmember Zager

ABSTAIN: None

GUS MORRISON
Mayor

ATTEST:

BARBARA HOWARD
Acting City Clerk

APPROVED AS TO FORM:

JAMES E. GONZALES
Senior Deputy City Attorney